

What is claimed is:

1. A method for maintaining data access during failure of a controller in a multiple controller storage subsystem, the storage subsystem having an array of data storage devices and more than one controller for managing the data storage, the method comprising:
  - a first controller saving internal state information; and
  - one or more of the other controllers carrying out the steps of:
    - pausing operation of the controller;
    - saving internal state information of the controller at the time of pausing;
  - and
  - continuing operation of the controller.
2. A method as claimed in claim 1, wherein the first controller detects an error in the first controller which triggers the saving of the internal state information.
3. A method as claimed in claim 1, wherein a host computer issues a transaction to the first controller which causes it to save its internal state information.
4. A method as claimed in claim 3, wherein the first controller resets after saving its internal state information.
5. A method as claimed in claim 1, wherein the first controller instructs the other controllers to save their internal state information and the other controllers carry out the defined steps when they receive the instruction.
6. A method as claimed in claim 1, wherein the one or more other controllers carry out the defined steps when they detect a loss of the first controller.

7. A method as claimed in claim 1, wherein the first controller and the one or more other controllers save their internal state information to a storage location in each controller.
8. A method as claimed in claim 1, wherein the first controller and the one or more other controllers save their internal state information to the storage devices and the information is retrieved from the storage devices at a later stage.
9. A method as claimed in claim 1, wherein the first controller instructs the other controllers to transfer their internal state information to the first controller.
10. A method as claimed in claim 9, wherein the first controller saves the combined internal state information to the storage devices.
11. A method as claimed in claim 1, wherein the multiple controllers are combined on a single card and/or share a single memory with each controller having a separate processor.
12. A method as claimed in claim 1, wherein in addition to the internal state information, a controller also saves some external memory data.
13. A method as claimed in claim 1, wherein the one or more other controllers save a subset of their internal state information.
14. A method as claimed in claim 1, wherein the internal state information saved by the one or more other controllers is determined by an instruction received from the first controller.

15. A method as claimed in claim 1, wherein problem analysis regarding an error in the first controller is carried out on the saved internal state information.
16. A method as claimed in claim 1, wherein the storage subsystem is a Fibre Channel Arbitrated Loop system and the multiple controllers are host bus adapters.
17. A method as claimed in claim 16, wherein during the defined method, interrupts are disabled.
18. A method as claimed in claim 16, wherein a flag is set in a host bus adapter during the saving of internal state information to prevent overlapping saves of internal state information in that adapter.
19. A method as claimed in claim 16, wherein an adapter saves information relating to an interface chip.
20. A computer program product stored on a computer readable storage medium for maintaining data access during failure of a controller in a multiple controller storage subsystem, the storage subsystem having an array of data storage devices and more than one controller for managing the data storage, comprising computer readable program code means for performing the steps of:
  - a first controller saving internal state information; and
  - one or more of the other controllers carrying out the steps of:
    - pausing operation of the controller;
    - saving internal state information of the controller at the time of pausing;
  - and
  - continuing operation of the controller.